

(12) UK Patent Application (19) GB (11) 2 390 079 (13) A

(43) Date of A Publication 31.12.2003

(21) Application No: 0214834.4

(22) Date of Filing: 27.06.2002

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(51) INT CL⁷:
B66F 11/04 3/46 7/28, E04G 21/16

(52) UK CL (Edition V):
B8L LA L23 L28 L44 L50
B8B BA BBB
B8J J13 J15 J19B J7A J8

(56) Documents Cited:
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(58) Field of Search:
UK CL (Edition V) B8B, B8J, B8L
INT CL⁷ B66F
Other: ONLINE : WPI, EPODOC, JAPIO.

(54) Abstract Title: Aerial lift platform with lifting jacks

(57) Material handling apparatus, for use on the work platform (12) of an aerial lift (10), comprises a pair of spaced apart lifting devices (21) each including a jack having a body (23) which rests on the platform (12) and is coupled inboard of a barrier (17) surrounding the platform (11) and a ram (24) having adaptor means (26) on its outer end for securing a material handling device (41) thereto. A support leg (29, Fig 4) spaced from the jack (22) also rests on the platform (11) and is coupled inboard of said barrier with a strut (33) extending between the body and leg. Both jacks (22) in use are located on the same side of the platform (11).

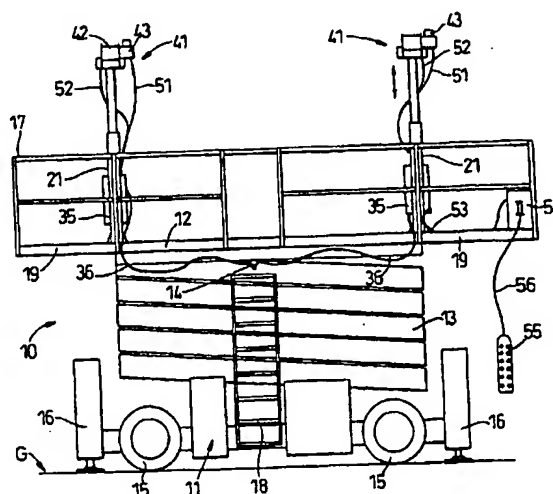


Fig. 1

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995. The print reflects an assignment of the application under the provisions of Section 30 of the Patents Act 1977.

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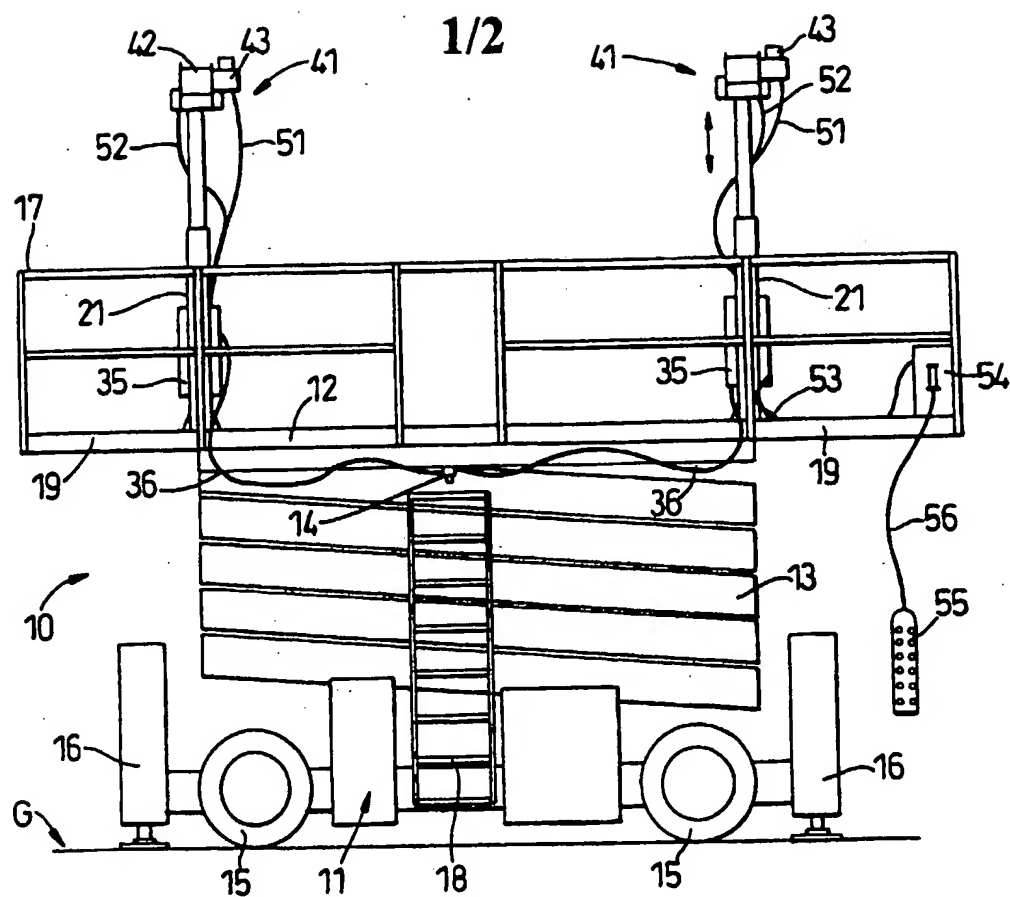


Fig. 1

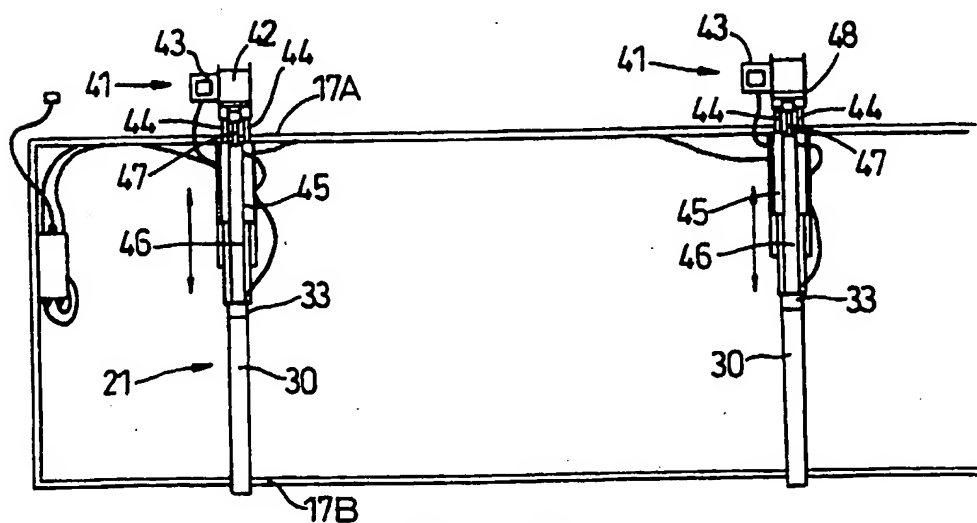


Fig. 2

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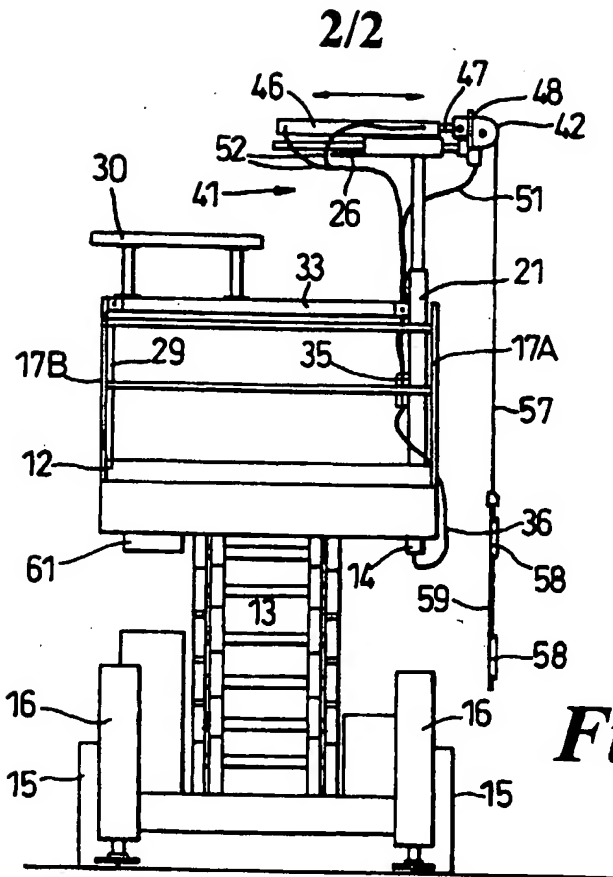


Fig. 3

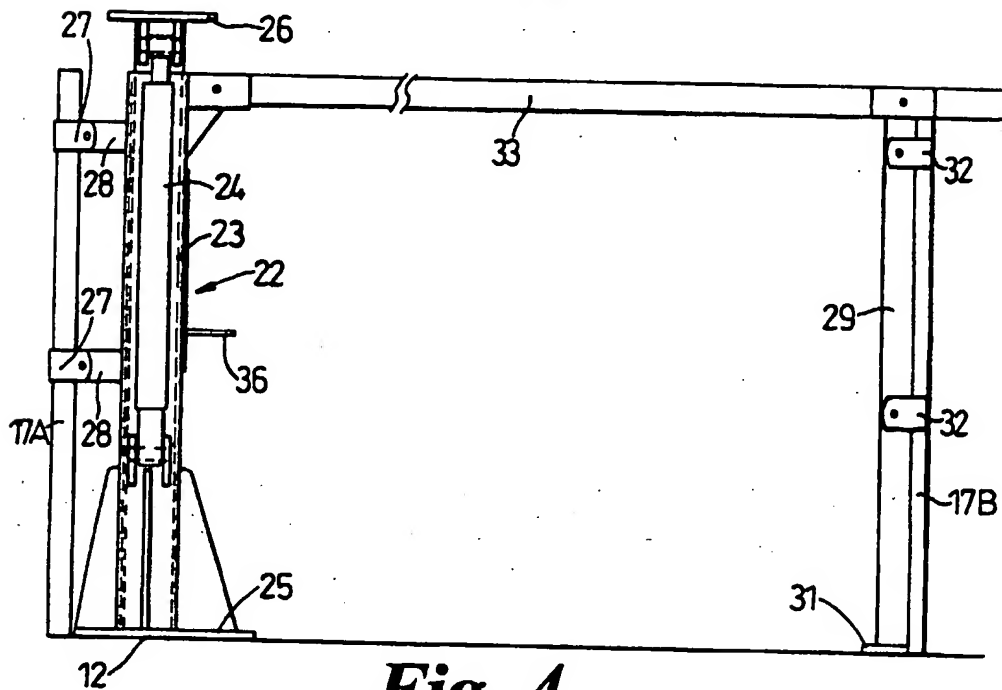


Fig. 4

Material Handling Apparatus

Field

- 5 This invention relates to material handling apparatus and in particular to apparatus used for lifting or supporting building materials.

Background of the Invention

- 10 Building construction sites for large buildings frequently employ construction equipment for lifting large and heavy components into position for fixing onto a building. Frequently, aerial lifts are employed for fixing building components at positions high above ground level. A typical
15 aerial lift is a mobile scissor lift available from JLG Ind. and which has a work platform which may be lifted into the air by a hydraulically operable scissor mechanism. For safety the work platform is surrounded by a safety barrier or fence.

20

- These lifts may be provided with auxiliary material handling equipment which is secured to the platform for manoeuvring building materials into location onto a building. However, since the lifts are safety equipment it is necessary when
25 fitting auxiliary equipment by means that effect the integrity of the lift, for example drilling holes in the platform, to have joint approval from the the lift.

manufacturer.

A further problem with scissor lifts in particular is that the work platform when in the lowered condition is still several metres about 2-2.5 meters above ground level. The lift is therefore not presently suited for handling heavy items such as cladding panels at lower heights.

The present invention provides auxiliary material handling apparatus that can be used on a work platform of an aerial lift without breaching the integrity of the lift structure and which provide a means of adapting an aerial lift for use in handling materials at lower heights.

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Statements of Invention

According to the present invention there is provided material handling apparatus to be used in combination with an aerial lift having a work platform surrounded by a safety barrier, the apparatus comprising a pair of spaced apart lifting devices, each lifting device comprising

a jack having a body which in use rests on the platform and coupling means for securing the body to the inside of said barrier to one side of the platform, and a ram having adaptor means on its outer end for securing a material handling device thereto,

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a support leg which in use also rests on the platform and has coupling means for securing the leg to the inside of said barrier at the other side of the platform, and

- 5 a strut extending between the body and leg,
the two jacks in use being located on the same side of the platform.

Preferably, each jack may be operated by any suitable
10 means, for example the ram may be displaced by mechanical means such as a pawl and ratchet mechanism, or screw threaded drive means, and is preferably hydraulic, the two hydraulic jacks being independantly operable through a hydraulic control means.

- 15 Each material handling device may be any device suitable for handling particular building components, for example a suitable cradle for lifting pipes, guttering, or soffit, but is preferably a hoist.

20 Each hoist includes a winch which may be operated by any suitable means, for example electric motors, and is preferably operated through a hydraulic motor.

- 25 Each winch is secured to the adaptor means by at least one support bar which extends substantially normal to the jack and is slidable in a support connected the adaptor means so

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that the winch is displaceable laterally along an axis normal to the jack.

Each winch is moved laterally by actuator means also
5 attached to the support, preferably a hydraulic actuator having a displaceable strut, the winch being attached to one end of the actuator strut.

Each lifting device has a respective hydraulic control
10 means to which its hydraulic actuator, hydraulic ram and hydraulic motor are connected.

The apparatus further includes electrical controls having a control panel for independent or simultaneous operation of
15 the two hydraulic control means.

The invention also provides an aerial lift having a work platform surrounded by a safety barrier, and material handing apparatus according to the present invention. The
20 lift is preferably a mobile self drive lift having a platform which is raised by a powered hydraulic system, wherein said hydraulic control means are connected into the powered hydraulic system of the lift.

25 The hydraulic control means are operable so that the hoist, and hydraulic actuator can be activated only when the lift is in its lowered condition.

Yet another aspect of the present invention provides a hoist for use with an aerial lift having a work platform, the hoist comprising a winch attached one end of a support bar which is slidable in a body, the body being secured to the work platform by adaptor means so that the winch is displaceable substantially horizontally relative to the platform, and each winch is moved laterally by actuator means also attached to the body, preferably a hydraulic actuator having a displaceable strut, the winch being attached to one end of the actuator strut.

Description of the Drawings

The invention will be described by way of example and with reference to the accompanying drawings in which:-

- Fig. 1 is a side elevation of an aerial lift in a lowered condition and provided with material handling apparatus according to the present invention,
- Fig. 2 is a plan view of the aerial lift shown in Fig. 1.
- Fig. 3 is a side elevation of the aerial lift shown in Fig.1 and Fig.2, and
- Fig. 4 is a side elevation taken on the other side from Fig.3, of a material handing apparatus according to the present invention.

Detailed Description of the Invention

With reference to Figs 1 to 3 of the drawings, there is shown an aerial lift 10 in the form of a self drive mobile scissor lift available from JLG Ind.. The lift 10 has a drivable vehicle body 11 that is drivable on wheels 15 and has a work platform 12 located on its body and which in use can be raised or lowered relative to the ground G. The platform 12 is shown in a lowered condition and the vehicle body is provided with stabilisers 16 at its corners which are lowered to provide stability during use of the lift. The work platform 12 is raised or lowered by a scissor type mechanism 13 typically operated by a powered hydraulic system provided on the lift. The hydraulic system is provided with a manifold 14 whereby hydraulic power may be taken from the powered system of the lift and used to operate the present invention. The platform 12 has extendable end portions 19 and the whole platform is provided with a safety barrier 17 formed from rails. An access ladder 18 is provided on the body 11 for access to the platform 12 when in the lowered condition.

The aerial lift is provided with an auxiliary material handling apparatus which comprises a pair of spaced apart lifting devices 21 which are supported on the work platform 12 at opposite ends thereof. The two lifting devices 21 are substantially identical to each other and will be described in detail with reference also to Fig 4.

Each device 21 comprises a substantially vertical hydraulic jack 22 having a body 23 and a reciprocable ram 24. The body 23 is provided with a larger area foot 25 which rests
5 on the platform. The head of the ram 24 is provided with an adaptor plate 26 to which different material handling devices can be mounted. The body 23 is located to one side of the platform 12 and is secured to the inside of the barrier rail 17A on said one side by clamps 27 which pass
10 around the barrier rail and are fastened to brackets 28 on the body 23.

A substantially vertical support leg 29, spaced from the jack 22, is provided with a foot 31 which rests on the
15 platform 12. The leg 29 is located on the other side of the platform 12 opposite to the jack 22 and is secured to the inside of the barrier rail 17B by clamps 32 which are fastened directly to the leg 29. A substantially horizontal strut 33 extends between the jack body 23 and may be
20 utilised to support a bracket 30 which can be used for storage of material on the platform if desired. The jack body 23, strut 33 and leg 29 form a rigid frame which spreads any loads on the material handling device 21 across the platform 12.

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Each hydraulic jack 22 is operated through a hydraulic control means 35 which is fixed to a bracket 36 (Fig. 3

only) on the inboard side of the jack body 23. The two hydraulic control means 35 are each independently connected by flexible hydraulic hose 36 to the manifold 14 for take-off of hydraulic power from the lift hydraulic system.

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The two lifting devices 21 are further provided with a material handling device 41 suitable for the job in hand which is mounted to the adaptor plate 26 on the ram 24. In this example the device 41 is a hoist for lifting and positioning cladding panels at locations upto the height of the safety barrier above ground level when the platform is in a lowered condition only. However other handling devices could be attached to the ram as is required.

15 Each hoist 41 comprises a winch 42 operated by a hydraulic motor 43. The motor 43 and winch 42 are mounted via a head 48 to the ends of a pair of spaced support bars 44 slidably mounted in a support block 45. The support block 45 in turn is secured to the adaptor plate 26. The winch and motor are
20 displaceable normally of the jack 22 by a hydraulic actuator 46 acting between the support block 45 and head 48 and having a reciprocable strut 47 which is displaceable to move the head 48 back and forth on the support bars 44.

25 The hydraulic motors 43 are connected via flexible hydraulic hose 51 to the respective hydraulic control means 35 and likewise the hydraulic actuators 46 are also

connected by flexible hydraulic hose 52 to the control means 35. The control means 35 is connected by electrical cable 53 to a control panel 54 which controls the operation of the hydraulic control means. The control panel may also
5 be operated through a remote pendulum set 55 which is connected to the panel 54 through electrical cable 56.

Each hoist 41 includes a winch 42 and cable 57 as is well known. When utilised for the handling of cladding the hoist
10 cable 57 may be attached to a jig 59 having vacuum suckers 58 mounted thereon. The vacuum suckers 58 are connected to a vacuum pump 61 located on the platform 12 by vacuum pipe. The vacuum pump is driven by power sources on the body 11 of the lift.

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The two hydraulic jacks 22 can be individually or jointly operated from the control panel 54 or pendulum set 55. The individual hoists 41 and hydraulic actuators 46 can also be likewise controlled from the panel 54 and pendulum set. The
20 control system is arranged so that the hoist motor 43, and hydraulic actuators 46 are operable only when the scissor lift is in its lowered condition.

In use, the use of the two jacks 22 may be utilised for
25 lifting over small height range and also to level any elongate material being handled if for example the lift 10 is stood on an uneven or inclined surface.

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The two hoists 41 and their respective actuators 46 provide
a means of lifting and manoeuvring material, in particular
cladding, which is to be located on a building at a height
5 below platform level. In practice, this is the first four
rows of cladding upwards from ground level.

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CLAIMS

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1. Material handling apparatus to be used in combination with an aerial lift having a work platform surrounded by a safety barrier, the apparatus comprising a pair of spaced
5 apart lifting devices, each lifting device comprising
- a jack having a body which in use rests on the platform and coupling means for securing the body inboard of said barrier to one side of the platform, and a ram having adaptor means on its outer end for
10 securing a material handling device thereto,
- a support leg which in use also rests on the platform and has coupling means for securing the leg inboard of said barrier at the other side of the platform, and
- a strut extending between the body and leg,
15 both jacks in use being located on the same side of the platform.
2. A material handling apparatus as claimed in Claim 1, wherein each jack comprises a hydraulic ram, the two jacks
20 being independently operable through respective hydraulic control means.
3. Apparatus as claimed in Claim 1 or Claim 2, wherein each material handling device comprises a hoist which is secured
25 to the adaptor means.
4. Apparatus as claimed in Claim 3 wherein each hoist is

operated through a hydraulic motor.

5. Apparatus as claimed in Claim 3 or Claim 4, wherein each hoist is secured to the adaptor means by at least one bar which extends substantially normal to the jack and is slidable in a support connected the adaptor means so that the hoist is displaceable along an axis normal to the jack.
6. Apparatus as claimed in Claim 5 wherein actuator means are mounted on the support to move the hoist relative to the support.
7. Apparatus as claimed in Claim 6 wherein the actuator means comprise a hydraulic actuator having a displaceable strut, the hoist being connected to one end of the strut.
8. Apparatus as claimed in Claim 7 when dependent upon Claim 4 and Claim 2, wherein each lifting device has a respective hydraulic control means to which its hydraulic actuator, hydraulic ram and hydraulic motor are connected.
9. Apparatus as claimed in Claims 8, wherein the apparatus further includes electrical controls having a control panel for independent or simultaneous operation of the two hydraulic control means.
9. An aerial lift having a work platform surrounded by a

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safety barrier, and further including apparatus as claimed in any one of Claims 1 to 8.

10. An aerial lift as claimed in Claim 9, when depending
5 from claim 2, the lift being a mobile self drive lift having a platform which is raised by a powered hydraulic system, wherein said hydraulic control means are connected into the powered hydraulic system of the lift.

10 11. An aerial lift as claimed in Claim 9 wherein the hydraulic control means are operable so that the hoist, and hydraulic actuator can be activated only when the lift is in its lowered condition.

15 12. A hoist for use with an aerial lift having a work platform, the hoist comprising a winch attached one end of a support bar which is slidable in a body, the body in use being secured to the work platform by adaptor means so that the winch is displaceable relative to the platform in a
20 plane substantially parallel thereto and each winch is moved laterally by actuator means also attached to the body, the winch being attached to one end of the actuator strut.

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INVESTOR IN PEOPLE

Application No: GB 0214834.4
Claims searched: 1-11

Examiner: Dave McMunn
Date of search: 17 January 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A		GB 2,358,012 A (COMPTON). See eg. latter part of abstract
A		DE 3,631,629 (SIEMENS). See Fig
A		JP 9169495 (KOMATSU). Note lifting device 44
A		JP 6329397 (KYUSHU). Note lifting devices 14, 71, 72
A		EP 0,393,004 A1 (GLACERIES). Note lifting device 4
A		US 3,937,340 (FULTON). Note lifting devices 50

Categories:

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category.	P Document published on or after the declared priority date but before the filing date of this invention.
& Member of the same patent family	B Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^v:

B8J. B8B. B8L.

Worldwide search of patent documents classified in the following areas of the IPC⁷:

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